

CLAIMS

What is claimed is:

1. A method for producing an expanded polystyrene bead having a coating,
said method comprising the steps of:
 - 5 providing an expandable polystyrene bead having a first surface area and
including polystyrene and at least one blowing agent;
 - expanding the expandable polystyrene bead to produce the expanded
polystyrene bead having a second surface area that is greater than the first surface area;
and
 - 10 applying a coating to the second surface area to reduce the abrasiveness of
the expanded polystyrene bead.
2. A method as set forth in claim 1 wherein the coating comprises a
polymeric wax.
3. A method as set forth in claim 2 wherein the polymeric wax comprises a
15 polymeric wax formed from monomers having from 1 to 8 carbon atoms.
4. A method as set forth in claim 3 wherein the polymeric wax formed from
monomers having from 1 to 8 carbon atoms comprises a polyethylene wax.
5. A method as set forth in claim 1 wherein the coating comprises an
aqueous dispersion of a polymeric wax.
- 20 6. A method as set forth in claim 1 wherein said step of applying the coating
to the second surface area comprises spraying the coating on the second surface area.

7. A method as set forth in claim 1 wherein said step of applying the coating to the second surface area comprises mixing the coating with the expanded polystyrene bead in a mixing apparatus.

8. A method as set forth in claim 1 wherein the expandable polystyrene bead has a glass transition temperature T_g and the blowing agent has a boiling point T_b and said step of expanding the expandable polystyrene bead comprises expanding the expandable polystyrene bead at a temperature of at least the boiling point T_b of the blowing agent and at a temperature of at least the glass transition temperature T_g of the expandable polystyrene bead.

9. A method as set forth in claim 1 further comprising the step of placing the expanded polystyrene bead in a mesh bag.

10. A method as set forth in claim 9 further comprising the step of aging the expanded polystyrene bead in the mesh bag such that the blowing agent diffuses out of the expanded polystyrene bead and air diffuses into the expanded polystyrene bead.

11. A method as set forth in claim 1 further comprising the step of aging the expanded polystyrene bead in an ambient temperature range for a period of at least 4 hours such that the blowing agent diffuses out of the expanded polystyrene bead and air diffuses into the expanded polystyrene bead.

12. A method for producing a polystyrene foam article wherein the polystyrene foam article includes a plurality of expanded polystyrene beads formed from a plurality of expandable polystyrene beads that include polystyrene and at least one blowing agent, said method comprising the steps of:

- 5 expanding the plurality of expandable polystyrene beads having a first surface area to produce the plurality of expanded polystyrene beads having a second surface area greater than the first surface area;
 aging the plurality of expanded polystyrene beads;
 placing the plurality of expanded polystyrene beads in a mold;
10 fusing the plurality of expanded polystyrene beads together to produce the polystyrene foam article having an outer surface area;
 removing the polystyrene foam article from the mold; and
 applying a coating to at least one of the second surface area of the plurality of expanded polystyrene beads and the outer surface area of the polystyrene foam article
15 to reduce the abrasiveness of the polystyrene foam article.

13. A method as set forth in claim 12 wherein the coating comprises a polymeric wax.

14. A method as set forth in claim 13 wherein the polymeric wax comprises a polymeric wax formed from monomers having from 1 to 8 carbon atoms.

20 15. A method as set forth in claim 14 wherein the polymeric wax formed from monomers having from 1 to 8 carbon atoms comprises a polyethylene wax.

16. A method as set forth in claim 12 wherein the coating comprises an aqueous dispersion of a polymeric wax.

17. A method as set forth in claim 12 wherein said step of applying the coating comprises spraying the coating on at least one of the second surface area of the plurality of expanded polystyrene beads and the outer surface area of the polystyrene foam article.

5 18. A method as set forth in claim 12 wherein said step of applying the coating comprises mixing the coating with at least one of the plurality of expanded polystyrene beads and the polystyrene foam article in a mixing apparatus.

19. A method as set forth in claim 12 wherein said step of applying the coating comprises applying the coating to the outer surface area of the polystyrene foam
10 article after said step of fusing the plurality of expandable polystyrene beads.

20. A method as set forth in claim 19 further comprising the step of drying a volatile portion of the coating from the outer surface area of the polystyrene foam article after said step of applying the coating.

21. A method as set forth in claim 20 wherein said step of drying comprises
15 drying the volatile portion of the coating from the outer surface area of the polystyrene foam article in a drying temperature range of between 40 and 50 °C .

22. A method as set forth in claim 12 wherein said step of applying the coating comprises applying the coating to the second surface area of the plurality of expanded polystyrene beads before said step of fusing the plurality of expandable
20 polystyrene beads.

23. A method as set forth in claim 12 wherein the plurality of expandable polystyrene beads have a glass transition temperature T_g and the blowing agent has a boiling point T_b and said step of expanding the plurality of expandable polystyrene beads

comprises expanding the plurality of expandable polystyrene beads at a temperature of at least the boiling point T_b of the blowing agent and at a temperature of at least the glass transition temperature T_g of the expanded polystyrene beads to produce the plurality of expanded polystyrene beads.

5 24. A method as set forth in claim 12 further comprising the step of placing the plurality of expanded polystyrene beads in a mesh bag.

 25. A method as set forth in claim 24 further comprising the step of aging the plurality of expanded polystyrene beads in the mesh bag such that the blowing agent diffuses out of the plurality of expanded polystyrene bead and air diffuses into the
10 plurality of expanded polystyrene beads.

 26. A method as set forth in claim 12 wherein said step of aging the plurality of expanded polystyrene beads comprises aging the plurality of expanded polystyrene beads in an ambient temperature range for a period of at least 4 hours such that the blowing agent diffuses out of the plurality of expanded polystyrene beads and air diffuses
15 into the plurality of expanded polystyrene beads.

 27. A method as set forth in claim 12 wherein the mold is a closed mold and said step of fusing the plurality of expanded polystyrene beads comprises fusing the plurality of expanded polystyrene beads in the closed mold.

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28. A polystyrene foam article having reduced abrasiveness, said article comprising:

an expanded polystyrene surface area formed from the expansion of an expandable polystyrene bead containing a blowing agent; and

5 a coating applied to said expanded surface area.

29. A polystyrene foam article as set forth in claim 28 wherein said coating comprises as a polymeric wax.

30. A polystyrene foam article as set forth in claim 29 wherein said polymeric wax comprises a polymeric wax formed from monomers having from 1 to 8 carbon
10 atoms.

31. A polystyrene foam article as set forth in claim 30 wherein said polymeric wax formed from monomers having from 1 to 8 carbon atoms comprises a polyethylene wax.

32. A polystyrene foam article as set forth in claim 28 wherein said coating
15 comprises an aqueous dispersion of a polymeric wax.

33. A polystyrene foam article as set forth in claim 28 wherein said polystyrene foam article is formed from a plurality of expanded polystyrene beads comprising polystyrene and at least one blowing agent.

34. A polystyrene foam article as set forth in claim 33 wherein said blowing
20 agent comprises a C₃ to C₆ hydrocarbon blowing agent.

35. A polystyrene foam article as set forth in claim 28 wherein the polystyrene foam article exhibits a reduction in weight after subjected to ASTM method D5264.